

9-10-1986

Papers Regarding the Plans and Reveal of the battery powered smoke detector and battery voltage monitoring circuit

Statitrol Corporation

Duane Pearsall

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Sept. 10, 1986

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REG. PAT. AGENT

Mr. Duane D. Pearsall
24758 Foothills Drive North
Golden, Colorado 80401

Re: Statitrol Battery-Monitoring
Smoke Detector

Dear Mr. Pearsall:

Pursuant to our recent telephone conference, I enclose herewith a Declaration by you, with attached Exhibits, which are copies of pages from the laboratory notebook of Lyman Blackwell, which we discussed.

Please review the Declaration and Exhibits and sign and date the Declaration in the spaces provided at the end. Then return the Declaration and exhibits to me in the enclosed stamped, self-addressed return envelope.

If you have any questions concerning any of the foregoing, please do not hesitate to call. Thank you for your cooperation in this matter.

Sincerely yours,


J. Terry Stratman

JTS:if
encls.

DECLARATION OF DUANE D. PEARSALL

I, DUANE D. PEARSALL, declare and say that:


1. I reside at 24758 Foothills Drive North, Golden, Colorado 80401.

2. During 1970 and 1971 I was President of Statitrol Corporation, a Colorado Corporation which had its principal place of business at 140 South Union Boulevard, Lakewood, Colorado 80228.


3. In late 1970 and early 1971, Statitrol Corporation developed a battery-powered smoke detector incorporating a battery voltage monitoring circuit.


4. On or shortly before October 15, 1970, Lyman L. Blackwell explained to me and I understood the operation of the smoke detector circuit with battery voltage monitoring, illustrated in the attached Exhibit 1.

On that date I signed the original of Exhibit 1.


~~Shortly prior to that date I witnessed the successful operation of a prototype of the circuit illustrated in Exhibit 1.~~ 

5. On or shortly before November 19, 1970, Lyman L. Blackwell explained to me and I understood the operation of the smoke detector circuit with battery monitoring illustrated in the attached Exhibit 2. On that date I signed and dated the original of Exhibit 2.

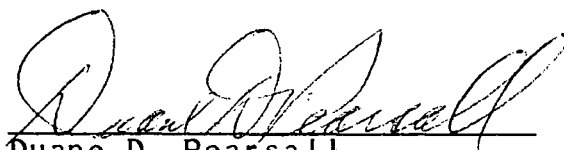
~~Shortly prior to that date I witnessed the successful operation of a prototype of the circuit illustrated in Exhibit 2.~~ 

6. On or shortly before November 19, 1970, Lyman L. Blackwell explained to me and I understood the operation of the battery monitoring circuit illustrated in the attached Exhibit 3. On that date I signed and dated the original of Exhibit 3. ~~Shortly prior to that date I witnessed the successful operation of a prototype of the circuit illustrated in Exhibit 3.~~ 

7. All of the activities recited in the foregoing paragraphs 4-6 occurred at the offices of Statitrol Corporation.

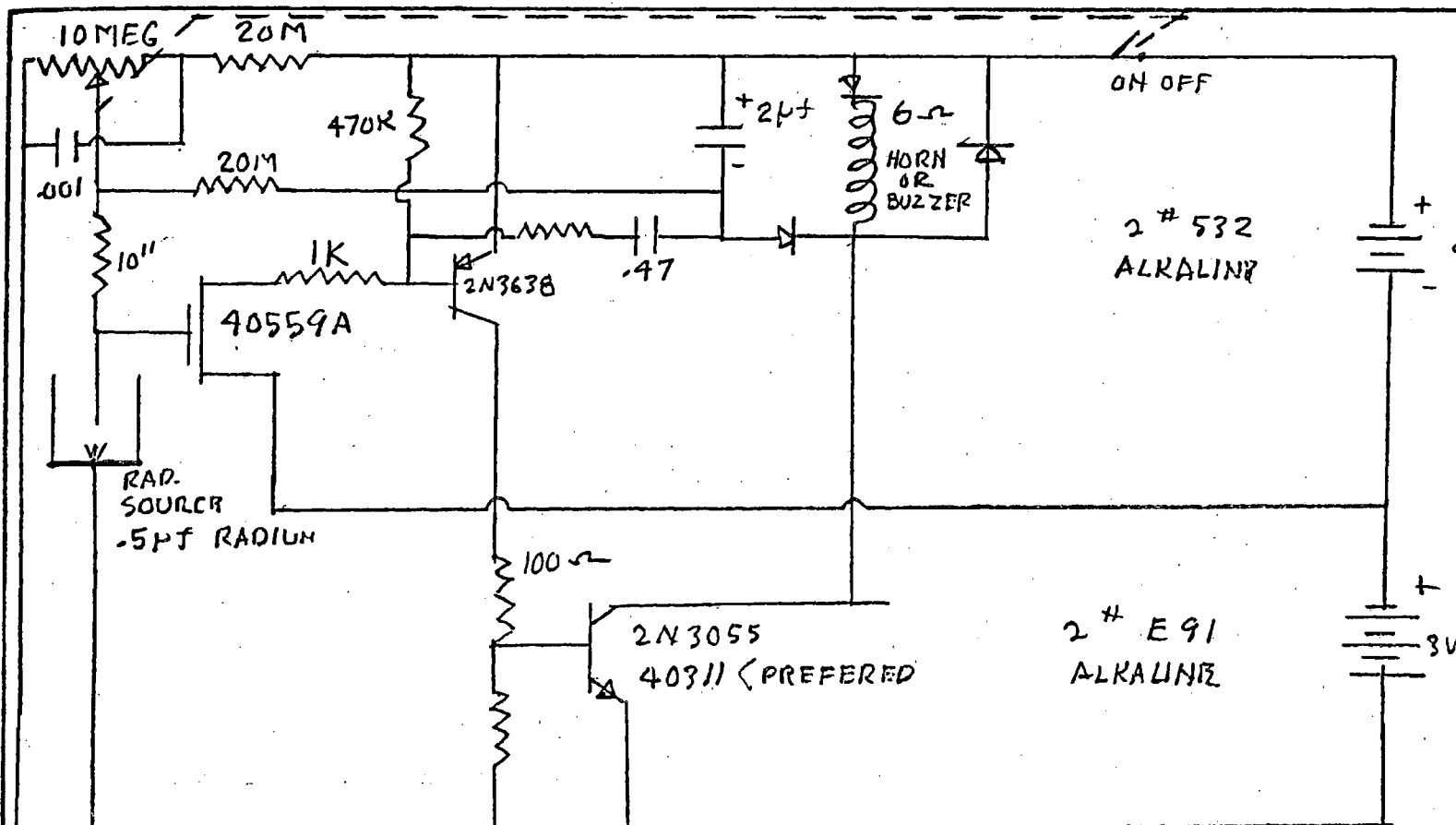
I declare further, that under penalty of perjury under the laws of the United States of America, the foregoing ^{AS CORRECTED} is true and correct. 

Executed on September 14, 1986 at Golden, Colorado.


Duane D. Pearsall

IONIZATION CHAMBER
TITLE BATTERY OPERATED FIRE DETECTOR

Project No. _____
Book No. _____



CURRENT
STANDBY CURRENT 20 MAMPS

PULSE ALARM 50-80 M.A.

CONTINUOUS ALARM - 150-200 M.A.

BATTERY
2 YEARS
10-20 HOURS
4 HOURS

WEAKENING BATTERIES CAUSE INTERMITTENT HORN ALARM
SMOKE PRODUCES INTERMITTENT ALARM (10 SEC) (2% OBS
CONTINUOUS 4% OBSCURITY SMOKE

TEMP. TEST ALARM 135° TO 146° F

EXHIBIT 1

Witnessed & Understood by me,

Date

Invented by

Date

PROTO
DECLIVE
STATI

Robert R. Howard

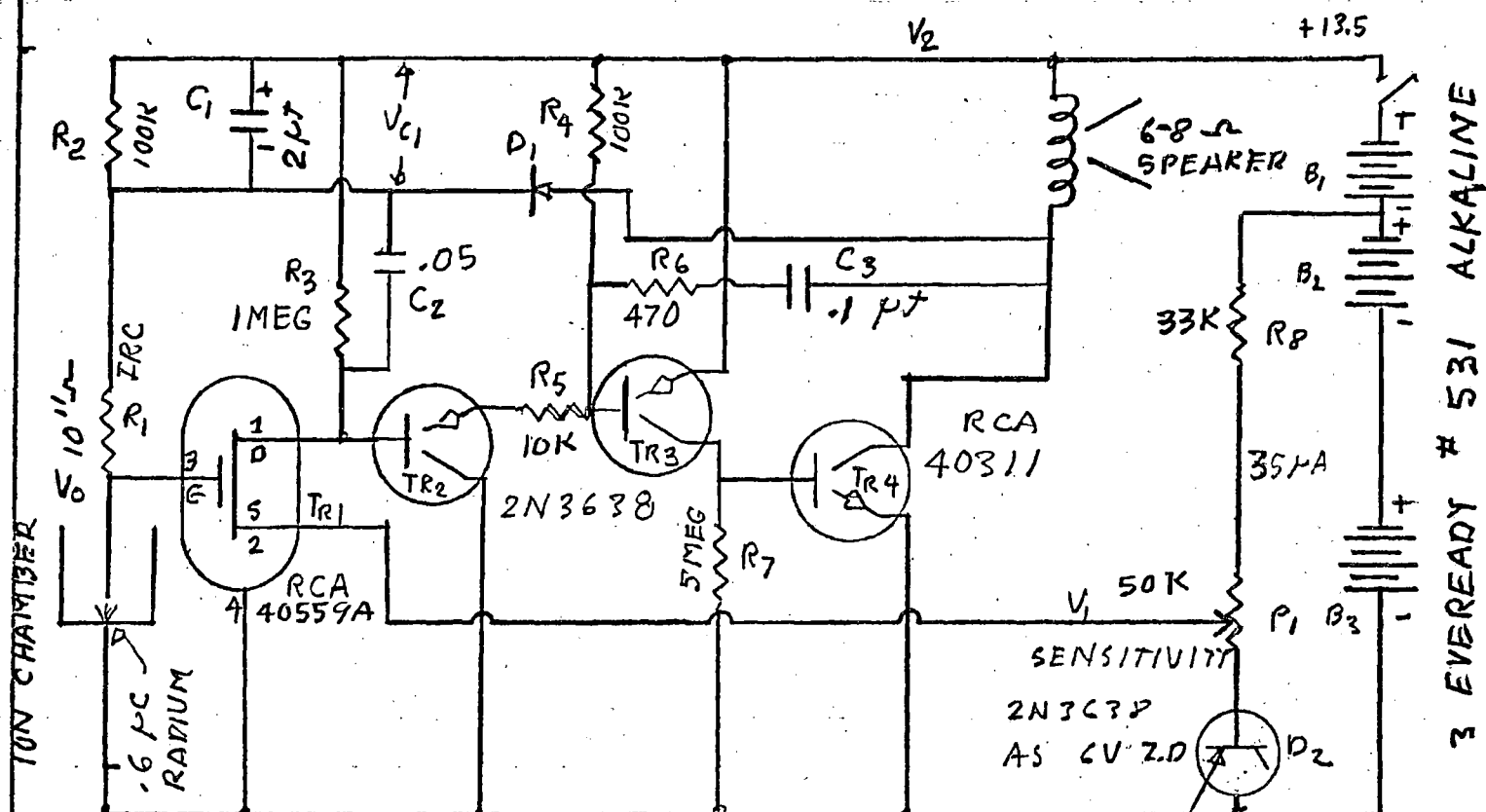
Oct 15, 1972

LL Blackwell

*OCT -
11-14*

TITLE BATTERY OPERATED FIRE DETECTOR
INTERMITTENT ALARM

Project No. _____
Book No. _____



OPERATION:

ION CHAMBER HOLDS TR1 OFF IN CLEAR AIR. (SENSITIVITY SET BY THE NEGATIVE BIAS VOLTAGE V_1 TO HOLD TR1 OFF) (2 VOLTS G-S HOLDS TR1 OFF). WITH TR1 OFF TR2, TR3, TR4 HOLD OFF, SMOKE IN CHAMBER CAUSES GATE 3 TO GO POSITIVE AND TR1 STARTS TO TURN ON. V_1 DROPS TO LESS THAN 2 VOLTS NEGATIVE WITH RESPECT TO SOURCE "S", TR1 TURNING ON TURNS TR2 ON, TURNING ON TR2 AND TR4 WHICH OSCILLATE PRODUCING SOUND IN SPEAKER. ($R_6 - C_3$ PROVIDES + FEEDBACK FOR OSCILLATION). C_2 PROVIDES A FAST PULSE WHICH DRIVES TR2 HARD ON PRODUCING SHARP LOUD NOISE IN SPEAKER. D_1 SUPPLIES NEGATIVE VOLTAGE TO C_1 WHICH DRIVES 'G' GATE OF TR1 - TURNING IT OFF. (VOLT. ACROSS $C_1 \sim 5$ - 10V). ALARM TURNS OFF UNTILL V_{C1} DECAYS THROUGH R_2 THEN ALARM AGAIN TURNS ON UNLESS SMOKE CLEARS CHAMBER. 45 μ A CURRENT THROUGH R_8, P_1 AND D_2 DRAIN BATTERIES B_1 AND B_2 TO CAUSE ALARM AFTER 10 HOURS TO WARN CUSTOMER TO REPLACE BATTERIES.

EXHIBIT 2

Witnessed & Understood by me,

Date

Invented by

Date

[Signature]

[Date]

[Signature]

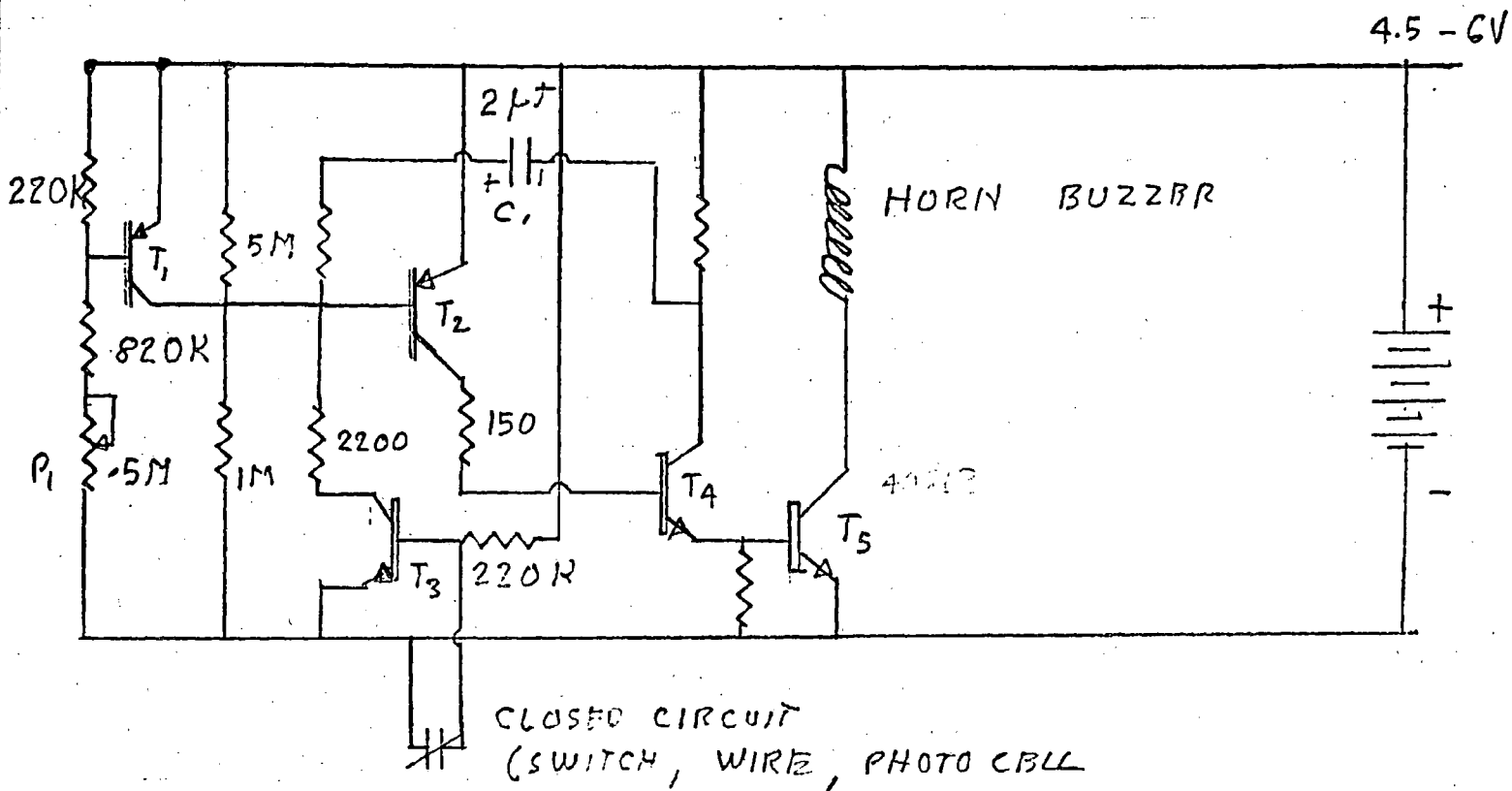
[Date]

B₁ B₂ ALARM WHEN CURRENT DROPS TO 5-10 MA AND
BATTERY VOLTAGE DROPS TO 5.6 VOLTS FROM 9. BATTERY
NRW HAS 700 MA. H₁₅ (20,000 HOURS AT 35 MA) AT 14,000
HOURS HAS 300 MA HOURS SUFFICIENT TO OPERATE ALARM
FOR 15 HOURS.

Project No. _____

TITLE LOW CURRENT BATTERY OPERATED ALARM Book No. _____

WITH AUTOMATIC LOW BATTERY AUDIO SIGNAL



T₁ - SENSES LOW BATTERY VOLTAGE AS SET BY P₁

T₂ - T₄ AMPLIFIER OSCILLATOR.

T₅ - HORN DRIVING AMPLIFIER.

EXHIBIT 3

Witnessed & Understood by me,

Date

Invented by

Date

[Signature]

Oct 14 1970

Sylvia L. Blackwell

Nov 11 70